REMARKS

I.

In the Office Action claims 1-7 and 15-16 were rejected as anticipated under 35 U.S.C. 102(b) by DE 2358254 by Sommer et al. The Office Action maintained that the instant claims are drawn to (a) a chromium-containing catalyst composition comprising zinc chromite and crystalline alpha-chromium oxide, wherein the a $ZnCr_2O_4$ contains between about 10 atom percent and 67 atom percent of the chromium in the composition and at least about 70 atom percent of the zinc in the composition, and wherein at least about 90 percent of the chromium present as chromium oxide in the composition is present as a $ZnCr_2O_4$ or crystalline alpha-chromium oxide, and (b) a method for preparing a chromium –containing catalyst composition comprising the steps of co-precipitation effectuated by the co-mixing of ammonium hydroxide, an aqueous zinc salt solution and a soluble trivalent chromium salt; further collection of the solid precipitate and addition of zinc chromite during calcination.

The Office Action maintained that Sommer et al. (in the fifth paragraph of the specification under the heading Description) discloses (a) the catalyst composition of zinc chromite and chromium oxide, with weight percentages; as well as (b) the procedure for making zinc chromite with chromium oxide, where the latter is in the form of ammonium dichromate, then an annealing step and the addition of the zinc chromite during the annealing step. (The Office Action indicated that a machine translated copy of Sommer et al. was provided and that a full translation will be forthcoming. After a telephone inquiry by the undersigned attorney on May 21, 2007, a further translation was provided by facsimile that same day.)

The Office Action further maintained with regard to the recitation of atom percent chromium and atom percent zinc, that these numerical values are inherent in the material as recited; and with regard to claims 6 and 7, if the product of a product-by-process claim is the same as a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process.

To begin with, Applicants note that while the mole ratio (or atom percent) of Zn and Cr might be inherent in a single compound such as $ZnCr_2O_4$, the mole ratio of Zn and Cr can vary greatly where there are multiple components having different relative contents on Zn and Cr (e.g., a $ZnCr_2O_4$ component and a Cr_2O_3 component). Applicants submit that Sommer et al. suggests catalysts containing significantly more chromium as a $ZnCr_2O_4$ component than the catalyst composition recited in Claim 1 of the present application. More particularly, Applicants note that Sommer et al. suggests in the fourth paragraph of the specification zinc chromite catalysts with molar ratios of zinc oxide to chromium (III) oxide from 0.8 to 1.2 to 0.5 to 0.8. Applicants submit that the zinc chromite catalyst of this type having the highest

molar ratio of chromium to zinc in the zinc chromite catalyst is one having equivalent molar amounts of zinc oxide and chromium (III) oxide (i.e., a 0.8:0.8 ratio of zinc oxide to chromium (III) oxide) and that this corresponds to a $ZnCr_2O_4$ itself with no additional ZnO; while the zinc chromite catalyst of this type having the lowest molar ratio of chromium to zinc in the zinc chromite catalyst is one having 2.4 moles of zinc oxide per mole of chromium (III) oxide (i.e., a 1.2:0.5 ratio of zinc oxide to chromium (III) oxide) and that this corresponds to 0.7 moles additional ZnO per 0.5 moles $ZnCr_2O_4$ (since 0.5 moles of the ZnO is included in the $ZnCr_2O_4$). Applicants note, however, that the Claim 1 composition of the present invention recites that the $ZnCr_2O_4$ component contains at least about 70 atom percent of the zinc in the composition, and that a zinc chromite catalyst of the Sommer et al. type corresponding to this 70 atom percent minimum has 1 mole of zinc oxide per 0.7 moles of chromium (III) oxide which corresponds to only about 0.21 moles additional ZnO (rather than full 0.7 moles additional ZnO permitted by the molar ratios in Sommer et al.) per 0.5 moles $ZnCr_2O_4$ (or proportionally 0.42 moles of additional ZnO per mole of $ZnCr_2O_4$). Applicants also note that the maximum amount of chromium (III) oxide added to the zinc chromite catalyst suggested by Sommer et al. in the fourth paragraph of the specification is 15 weight percent.

Applicants have calculated that for a 1 kg sample of $ZnCr_2O_4$ itself with no additional ZnO there are 4.28 moles of zinc oxide and 4.28 moles of chromium (III) oxide (all as $ZnCr_2O_4$), and that if 0.15 kg (i.e., 15 weight percent) additional chromium (III) oxide is added this would be 0.99 moles of added chromium (III) oxide. If the 1 kg sample included 15% copper oxide and cadmium oxide, there would only be 3.64 moles of zinc oxide and 3.64 moles of chromium (III) oxide (i.e. 85% of the prior amount).

Applicants have further calculated that for a 1 kg sample of zinc chromite catalyst having 0.21 moles additional ZnO per 0.5 moles $ZnCr_2O_4$ there are 5.31 moles of zinc oxide (3.74 moles as $ZnCr_2O_4$) and 3.74 moles of chromium (III) oxide (all as $ZnCr_2O_4$), and that if 0.15 kg (i.e., 15 weight percent) additional chromium (III) oxide is added this would be 0.99 moles of added chromium (III) oxide. If the 1 kg sample included 15% copper oxide and cadmium oxide, there would only be 4.51 moles of zinc oxide and 3.18 moles of chromium (III) oxide (i.e. 85% of the prior amount).

Accordingly, Applicants note that for these samples the zinc chromite component of the final composition contains between about 76.3 and 81.2 atom percent of the chromium in the composition (with the remainder of the chromium being attributed to the 0.99 moles of added chromium (III) oxide). Applicants submit that this range is significantly above even the highest level indicated for the compositions of Claim 1. Moreover, as explained above, the molar ratio ranges provided in Sommer et al. permits zinc levels outside of $ZnCr_2O_4$ component that are significantly higher than the levels recited in Claim 1.

Applicants note that dependent claims provide even further distinction from the compositions suggested by Sommer et al. (note in particular claims 3 and 5).

With particular regard to claims 6 and 7, Applicants submit that treatment of oxides such as alpha-chromium oxide with a fluorinating agent results in the presence of additional components to the composition such as fluorides and/or oxyfluorides; and that Sommer et al. does not suggest fluorides and/or oxyfluorides as components.

With further regard to method claims 15 and 16, Applicants note that the aqueous solution in (a) of Claim 15 has a zinc concentration of about 5 mole percent to about 25 mole percent of the total concentration of zinc and chromium in the solution; and that accordingly, the lowest ratio of Cr to Zn in the solution is about 3:1. Applicants submit that this is clearly different from the zinc chromite catalysts of Sommer et al. where the highest ratio of Cr to Zn is 2:1 ((0.8 moles chromium oxide x 2 moles chromium per mole of chromium oxide)/0.8 moles zinc oxide) and even accounting for the presence of copper oxide and/or cadmium oxide and adding additional chromium (III) oxide as illustrated above in connection with the Sommer et al. compositions, the ratio of Cr to Zn in the final Sommer et al. composition is still less than 3:1.

In sum, Applicants submit that Claims 1-7 and 15-16 are clearly not anticipated by the catalysts suggested by Sommer et al..

II.

In the Office Action, Claims 1-7 were rejected as unpatentably obvious when Sommer et al. is considered in view of U.S. Patent Application Publication No. US2001/0011061 by Scott et al. The Office Action indicated that the instant claims are drawn to a chromium-containing catalyst composition comprising zinc chromite and crystalline alpha-chromium oxide, prepared by the treatment of the composition with a fluorinating agent. The Office Action maintained that Sommer et al. (in the fifth paragraph of the specification under the heading Description) discloses the catalyst composition of zinc chromite with chromium oxide, and that although Sommer et al. does not explicitly disclose the use of fluorination agent, Scott et al. teaches the use of fluorination agents like hydrogen fluoride and chloro-2,2,2-trifluoroethane (pages 3-4 Examples 1-2 sections [0031]-[0042] were noted). The Office Action further maintained that it would have been obvious to a person skilled in the art at the time the invention was made to use the fluorinating agent taught in Scott et al. since the method therein involved a zinc-chromium catalyst composition which is similar to the zinc-chromium catalyst composition of Sommer et al.; and that one of ordinary skill in the art would have been motivated to use the fluorination agent taught in Scott et al. for the catalyst composition in Sommet et al. since the fluorination agent was found to enhance the crystallinity of the catalyst composition rendering it more potent as a catalyst.

As indicated above, Applicants submit that Sommer et al. does not disclose compositions of the types now claimed in claims 1-7 of the present application. Applicants further note that the composition having the minimum amount of zinc corresponds to the composition described above containing the highest molar ratio of chromium to zinc (i.e. the composition containing 3.64 moles of zinc oxide per 1.15 kg after the additional chromium (III) oxide is added) and that these compositions contain above about 20 weight percent zinc. Moreover, Applicants note that Sommer et al. addresses certain catalytic transformations of alcohols

In contrast, Applicant note that Scott et al. describes at paragraph [0008] an improved zinc-promoted chromia fluorination catalyst wherein the chromia ia at least partially crystalline and the catalyst comprises zinc or a compound of zinc in an amount of less than about 3% by weight of the catalyst. Applicants further note the assertion at paragraph [0011] that whilst the activity-promoting of zinc in catalysts wherein the chromia is amorphous is generally greater than about 2% by weight and usually greater than about 5% by weight depending upon the method of production of the catalyst, the activity promoting amount of zinc in the partially crystalised catalysts of the invention should generally be less than about 2% by weight, preferably no greater than about 1% by weight.

Applicants submit that neither Sommer et al. nor Scott et al. suggest using the compositions having a relatively high zinc content used in Sommer et al. for certain transformations of alcohols as catalysts, for reactions such as fluorinations described in Scott et al.. Indeed, Scott et al. indicates a paragraph [0011] that zinc can act as a catalyst poison if present in too large an amount. Accordingly, Applicants submit that treatment of the Sommer et al. compositions with a fluorinating agent is also not suggested Scott et al..

III.

In the Office Action claims 8-14 were rejected as unpatentably obvious when viewed in light of GB2275924 to Scott et al. The Office Action indicated that the instant claims are drawn to a process for changing the fluorine distribution in a halogenated hydrocarbon, or incorporating fluorine in a saturated or unsaturated hydrocarbon, in the presence of chromium-containing catalyst compositions by reacting said compound with hydrogen fluoride in the vapor phase. The Office Action maintained that Scott et al. GB discloses a process for the production of a fluoro-aromatic compound which comprises contacting a chloro-aromatic compound with hydrogen fluoride in the vapor phase in the presence of a chromium-containing catalyst; that it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the fluorination process with the parameters disclosed therein by Scott et al. GB since this method is a process for the production of a fluoro-aromatic compound which is essentially a fluorination technique akin to the instant

claims; and that one having ordinary skill in the art would have been motivated to do this since the fluorination processes are equivalent and the artisan would have reached a reasonable expectation of success in utilizing the teachings of Scott et al. GB.

Applicants note that the processes of claims 8 through 14 all involve using as a catalyst at least one composition selected from the group consisting of (i) the chromium-containing catalyst compositions of Claim 1 and (ii) chromium-containing compositions prepared by treatment of a composition of Claim 1 with a fluorination agent. Applicants note that Scott et al. GB indicates at the top of page 4 that suitable catalysts are described in European Patent Publication No. 502605 A1, which Applicant understands is a counterpart of U.S. Patent No. 5,281,568 (already of record). Applicant submits that Scott et al. GB does not teach or fairly suggest the (i) the chromium-containing catalyst compositions of Claim 1 and (ii) chromium-containing compositions prepared by treatment of a composition of Claim 1 with a fluorination agent. Accordingly, Applicants submit that Scott et al. GB does not teach or fairly suggest use of such compositions as claimed in claims 8 through 14. Applicants submit that the processes of claims 10 through 14 are particularly distinct from the Scott et al. GB fluorination process.

IV.

The specification is being amended to insert priority information and to provide international application numbers for three documents referenced in the application. The international application numbers referenced in the application relate to documents corresponding to US Application Nos. 10/572,627, 10/572,626 and 10/572,625.

In view of the foregoing, allowance of the above-referenced application is respectfully requested.

Respectfully submitted,

DAVID E. HEISER
ATTORNEY FOR APPLICANTS
Registration No.: 31,366
Telephone: (302) 892-1926
Facsimile: (302) 892-7949

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